CONTENTS OF VOLUME 3

ARTICLES AND SHORT COMMUNICATIONS

ADENSTEDT, ROLF K. Asymptotically efficient estimators for a constant regression with vector-valued stationary residuals 1109–1121

ADICHIE, J. N. On the use of ranks for testing the coincidence of several regression lines 521–527

AFSARINEJAD, K. AND HEDAYAT, A. Some contributions to the theory of multistage Youden design 707–711

AKAHIRA, MASAFUMI AND TAKEUCHI, KEI. Characterizations of prediction sufficiency (adequacy) in terms of risk functions 1018–1024

ANDERSON, T. W. Maximum likelihood estimation of parameters of autoregressive processes with moving average residuals and other covariance matrices with linear structure 1283–1304

ANDERSSON, STEEN. Invariant normal models 132–154

ARNOLD, BARRY C. AND MEEDEN, GLEN. Characterization of distributions by sets of moments of order statistics 754–758

ARVESEN, JAMES N. AND LAYARD, MAXWELL W. J. Asymptotically robust tests in unbalanced variance component models 1122–1134

BAI, DO SUN. Efficient estimation of transition probabilities in a Markov chain 1305–1317

BANCROFT, T. A., HAN, CHIEN-PAI AND MEAD, RONALD. Power of analysis of variance test procedures for incompletely specified models ... 797–808

BEHNEN, K. AND NEUHAUS, G. A central limit theorem under contiguous alternatives 1349–1353

BERAN, RUDOLF. Local asymptotic power of quadratic rank tests for trend 401–412

BERAN, RUDOLF. Tail probabilities of noncentral quadratic forms 969–974

BERGER, JAMES. Minimax estimation of location vectors for a wide class of densities 1318–1328

BERK, ROBERT H. Comparing sequential and nonsequential tests 991–998

BERK, ROBERT H. Locally most powerful sequential tests 373–381

BICKEL, P. J. AND LEHMANN, E. L. Descriptive statistics for nonparametric models.

I. Introduction 1038–1044

II. Location 1045–1069

BOCK, M. E. Minimax estimators of the mean of a multivariate normal distribution 209–218

BONDESSON, LENNART. Uniformly minimum variance estimation in location parameter families 637–660

BROWN, L. On a theorem of Morimoto concerning sufficiency for discrete distributions 1180–1182

CAINES, P. E. A note on the consistency of maximum likelihood estimates for finite families of stochastic processes 539–546
CAUSEY, B. Upper confidence and fiducial limits to the range of several means 473–477
CHIKUSE, Y. AND MUIRHEAD, R. J. Asymptotic expansions for the joint and marginal distributions of the latent roots of the covariance matrix 1011–1017
COBB, E. BENTON. A note on sampling with replacement 500–503
COBERLY, W. A., LEWIS, T. O. AND GRAY, H. L. On Edgeworth expansions with unknown cumulants 741–746
COHEN, ARTHUR AND SACKROWITZ, H. B. Unbiasedness of the chi-square, likelihood ratio, and other goodness of fit tests for the equal cell case 959–964
COVER, THOMAS M. AND HIRSCHLER, PATRICK. A finite memory test of the irrationality of the parameter of a coin 939–946
CRAIN, BRADFORD R. AND MORGAN, RONNIE L. Asymptotic normality of the posterior distribution for exponential models 223–227
DAVIS, KATHRYN BULLOCK. Mean square error properties of density estimates 1025–1030
DE MONTRICHER, G. F., TAPIA, R. A., AND THOMPSON, J. R. Nonparametric maximum likelihood estimation of probability densities by penalty function methods 1329–1348
DION, JEAN-PIERRE. Estimation of the variance of a branching process 1183–1187
EFRON, BRADLEY. Defining the curvature of a statistical problem (with applications to second order efficiency). Discussion by D. R. Cox, A. P. Dawid, J. K. Ghosh, N. Keiding, L. Le Cam, D. V. Lindley, J. Pfanzagl, D. A. Pierce, C. R. Rao, J. Reeds 1189–1242
FEDER, PAUL I. The log likelihood ratio in segmented regression 84–97
FEDER, PAUL I. On asymptotic distribution theory in segmented regression problems—identified case 49–83
FEDERER, W. T. AND HEDAYAT, A. On the nonexistence of Knut Vik designs for all even orders 445–447
FEDERER, W. T. and RAGHAVARAO, D. On connectedness in two-way elimination of heterogeneity designs 730–735
FISHBURN, PETER C. Unbounded expected utility 884–896
FLUECK, JOHN A. AND KORSH, JAMES F. A generalized approach to maximum likelihood paired comparison ranking 846–861
FRASER, D. A. S. AND MACKAY, JOCK. Parameter, factorization and inference based on significance, likelihood, and objective posterior 559–572
FU, JAMES C. The rate of convergence of consistent point estimators .. 234–240
GASTWIRTH, JOSEPH L. AND RUBIN, HERMAN. The asymptotic distribution theory of the empiric cdf for mixing processes 809–824
GASTWIRTH, JOSEPH L. AND RUBIN, HERMAN. The behavior of robust estimators on dependent data 1070–1100

GINÉ M., EVARIST. Invariant tests for uniformity on compact Riemannian manifolds based on Sobolev norms 1243–1266
GOEL, PREM K. On re-pairing observations in a broken random sample 1364–1369
GOLDSTEIN, M. Approximate Bayes solutions to some nonparametric problems 512–517
GOLDSTEIN, MICHAEL. A note on some Bayesian nonparametric estimates 736–740
GOOD, I. J. The Bayes factor against equiprobability of a multinomial population assuming a symmetric Dirichlet prior 246–250
GRAY, H. L., COBERLY, W. A., AND LEWIS, T. O. On Edgeworth expansions with unknown cumulants 741–746
GUSEMAN, L. F., JR., PETERS, B. CHARLES, JR. AND WALKER, HOMER F. On minimizing the probability of misclassification for linear feature selection 661–668
HABERMAN, SHELBY J. Direct products and linear models for complete factorial tables 314–333
HABERMAN, SHELBY J. How much do Gauss-Markov and least squares estimates differ? A coordinate-free approach 982–990
HAMADA, NOBORU AND TAMARI, FUMIKAZU. Duals of BIB block designs from an affine geometry 926–938
HAN, CHIEN-PAI, MEAD, RONALD, AND BANCROFT, T. A. Power of analysis of variance test procedures for incompletely specified fixed models 797–808
HANNAN, E. J. The estimation of ARMA models 975–981
HARTIGAN, J. A. Necessary and sufficient conditions for asymptotic joint normality of a statistic and its subsample values 573–580
HASMINSKII, R. Z. AND IBRAGIMOV, I. A. On a lower bound for moments of point estimators 228–233
HEDAYAT, A. AND AFSARINEJAD, K. Some contributions to the theory of multistage Youden design 707–711
HEDAYAT, A. AND FEDERER, W. T. On the nonexistence of Knut Vik designs for all even orders 445–447
HEDAYAT, A., RAGHAVARAO, D. AND SEIDEN, E. Further contributions to the theory of F-squares design 712–716
HILL, BRUCE M. A simple general approach to inference about the tail of a distribution 1163–1174
HIPP, C. Note on the paper "Transformation groups and sufficient statistics" by J. Pfanzagl 478–482
HIRSCHLER, PATRICK AND COVER, THOMAS M. A finite memory test of the irrationality of the parameter of a coin 939–946
HOKE, ALBERT T. The characteristic polynomial of the information matrix for second-order models 780–786
HORDIJK, ARIE AND TIJMS, HENK. A modified form of the iterative method of undiscounted dynamic programming 203–208

HORN, SUSAN D. On the optimality criterion in compound decision problems 767–772
HOYLE, M. H. Estimating generating functions 1361–1363
HWANG, T. Y. AND KLOTZ, J. H. Bahadur efficiency of linear rank statistics for scale alternatives 947–954
IBRAGIMOV, I. A. AND HASMINSKII, R. Z. On a lower bound for moments of point estimators 228–233
JAQUETTE, STRATTON C. Markov decision processes with a new optimality criterion: Continuous time 547–553
JENSEN, D. R. AND MAYER, L. S. Normal-theory approximations to tests for linear hypotheses 429–444
JOHN, PETER W. M. Isomorphic $L_2(7)$ designs 728–729
JOHNSON, BRUCE MCK. Bounds on the variance of the U-statistics for symmetric distributions with shift alternatives 955–958
JOSHI, V. M. A conjecture of Berry regarding a Bernoulli two-armed bandit 189–202
JOSHI, V. M. On the minimax estimation of a random probability with known first N moments 680–687
JOSHI, V. M. Strong admissibility of a set of confidence intervals for the mean of a finite population 483–488
KEIDING, NIELS. Maximum likelihood estimation in the birth-and-death process 363–372
KIEFER, J. Balanced block designs and generalized Youden designs, I. Construction (patchwork) 109–118
KIMELDORF, GEORGE AND SMITH, FURMAN. Discrete sequential search for one of many objects 906–915
KLEYLE, ROBERT. Upper and lower posterior probabilities for discrete distributions 504–511
KLOTZ, J. H. AND HWANG, T. Y. Bahadur efficiency of linear rank statistics for scale alternatives 947–954
KORSH, JAMES F. AND FLUECK, JOHN A. A generalized approach to maximum likelihood paired comparison ranking 846–861
LAI, TZE LEUNG. A note on first exit times with applications to sequential analysis 999–1005
LAI, TZE LEUNG. On Chernoff-Savage statistics and sequential rank tests 825–845
LAI, TZE LEUNG. Termination, moments and exponential boundedness of the stopping rule for certain invariant sequential probability ratio tests 581–598
LAWRENCE, M. J. Inequalities of s-ordered distributions 413–428
LAYARD, MAXWELL W. J. AND ARVESEN, JAMES N. Asymptotically robust tests in unbalanced variance component models 1122–1134
LEHMANN, E. L. AND BICKEL, P. J. Descriptive statistics for nonparametric models.

I. Introduction 1038–1044
II. Location 1045–1069
LEWIS, T. O., GRAY, H. L. AND COBERLY, W. A. On Edgeworth expansions with unknown cumulants 741–746
LIN, PI-ERH. Rates of convergence in empirical Bayes estimation problems: Continuous case 155–164
LITTELL, RAMON C., RAO, P. V. AND SCHUSTER, EUGENE F. Estimation of shift and center of symmetry based on Kolmogorov-Smirnov statistics 862–873
MACKAY, JOCK AND FRASER, D. A. S. Parameter, factorization and inference based on significance, likelihood and objective posterior 559–572
MAURER, WILLI. On most effective tournament plans with fewer games than competitors 717–727
MAYER, L. S. AND JENSEN, D. R. Normal-theory approximations to tests for linear hypotheses 429–444
MCDONALD, LYMAN. Tests for the general linear hypothesis under the multiple design multivariate linear model 461–466
MEAD, RONALD, BANCROFT, T. A. AND HAN, CHIEN-PAI. Power of analysis of variance test procedures for incompletely specified fixed models 797–808
MEEDEN, GLEN AND ARNOLD, BARRY C. Characterization of distributions by sets of moments of order statistics 754–758
MEHRA, K. L. AND RAO, M. SUDHAKARA. On functions of order statistics for mixing processes 874–883
MEHRAN, FARHAD. Relationships between the UMVU estimators of the mean and median of a function of a normal distribution 457–460
MOORE, DAVID S. AND SPRUILL, M. C. Unified large-sample theory of general chi-squared statistics for tests of fit 599–616
MORGAN, RONNIE L. AND CRAIN, BRADFORD R. Asymptotic normality of the posterior distribution for exponential models 223–227
MORRIS, CARL. Central limit theorems for multinomial sums 165–188
MOST, BERNARD M. Resistance of balanced incomplete block designs 1149–1162
MUIRHEAD, R. J. AND CHIKUSE, Y. Asymptotic expansions for the joint and marginal distributions of the latent roots of the covariance matrix 1011–1017
NEUHAUS, GEORG. Convergence of the reduced empirical process for non-i.i.d. random vectors 528–531
NEUHAUS, G. AND BEHNEN, K. A central limit theorem under contiguous alternatives 1349–1353
ODÉN, ANDERS AND WEDEL, HANS. Arguments for Fisher's permutation test 518–520
O'REILLY, FEDERICO J. On a criterion for extrapolation in normal regression 219–222

PARANJAPE, S. R. AND RUBIN, HERMAN. Special case of the distribution of the median 251–256
PERLMAN, MICHAEL D. AND WICHURA, MICHAEL J. A note on substitution in conditional distribution 1175–1179
PETERS, B. CHARLES, JR., WALKER, HOMER F. AND GUSEMAN, L. F., JR. On minimizing the probability of misclassification for linear feature selection 661–668
PICKANDS, JAMES III. Statistical inference using extreme order statistics 119–131
PIERCE, DAVID A. Noninvertible transfer functions and their forecasts 1354–1360
PILLAI, K. C. S. The distribution of the characteristic roots of $S_1S_2^{-1}$ under violations 773–779
PILLAI, K. C. S. AND SUDJANA. Exact robustness studies of tests of two multivariate hypotheses based on four criteria and their distribution problems under violations 617–636
POLLAK, M. AND SIEGMUND, D. Approximations to the expected sample size of certain sequential tests 1267–1282
PORTNOY, STEPHEN L. Admissibility of the best invariant estimator of one coordinate of a location vector 448–450
RAGHAVARAO, D. AND FEDERER, W. T. On connectedness in two-way elimination of heterogeneity designs 730–735
RAGHAVARAO, D., SEIDEN, E. AND HEDAYAT, A. Further contributions to the theory of F-squares design 712–716
RAMAKRISHNAN, M. K. Choice of an optimum sampling strategy—I .. 669–679
RAO, J. S. AND SETHURAMAN, J. Weak convergence of empirical distribution functions of random variables subject to perturbations and scale factors 299–313
RAO, M. SUDHAKARA AND MEHRA, K. L. On functions of order statistics for mixing processes 874–883
RAO, P. V., SCHUSTER, EUGENE F. AND LITTELL, RAMON C. Estimation of shift and center of symmetry based on Kolmogorov-Smirnov statistics 862–873
RECHTSCHAFFEN, R. Weak convergence of the empiric processes for independent random variables 787–792
REYNOLDS, MARION R., JR. A sequential signed-rank test for symmetry 382–400
ROBERTSON, TIM AND WRIGHT, F. T. Consistency in generalized isotonic regression 350–362
ROBINSON, P. M. Continuous time regressions with discrete data 688–697
ROSENBLATT, M. A quadratic measure of deviation of two-dimensional density estimates and a test of independence 1–14
ROSS, SHELDON M. A note on optimal stopping for success runs 793–795
RUBIN, HERMAN AND GASTWIRTH, JOSEPH L. The asymptotic distribution theory of the empiric cdf for mixing processes 809–824

RUBIN, HERMAN AND GASTWIRTH, JOSEPH L. The behavior of robust estimators on dependent data 1070–1100
RUBIN, HERMAN AND PARANJAPE, S. R. Special case of the distribution of the median 251–256
RUYMGAART, F. H. A note on chi-square statistics with random cell boundaries 965–968
SACKROWITZ, H. B. AND COHEN, ARTHUR. Unbiasedness of the chi-square, likelihood ratio, and other goodness of fit tests for the equal cell case 959–964
SACKS, JEROME. An asymptotically efficient sequence of estimators of a location parameter 285–298
SAGER, THOMAS W. Consistency in nonparametric estimation of the mode 698–706
SAMPSON, ALLAN R. Characterizing exponential family distributions by moment generating functions 747–753
SANTNER, THOMAS J. A restricted subset selection approach to ranking and selection problems 334–349
SCHUSTER, EUGENE F., LITTELL, RAMON C. AND RAO, P. V. Estimation of shift and center of symmetry based on Kolmogorov-Smirnov statistics 862–873
SCHWALLER, RICHARD L. AND TIAHRT, KENNETH J. A method of constrained randomization for $p_1^{n_1}p_2^{n_2}\cdots p_k^{n_k}$ factorials 1135–1148
SCOTT, A. J. On admissibility and uniform admissibility in finite population sampling 489–491
SEIDEN, E., HEDAYAT, A. AND RAGHAVARAO, D. Further contributions to the theory of F-squares design 712–716
SEKKAPPAN, RM. AND THOMPSON, M. E. On a class of uniformly admissible estimators for finite populations 492–499
SEN, ASHISH AND SRIVASTAVA, MUNI S. On tests for detecting change in mean 98–108
SENGUPTA, SAILES K. Lower semicontinuous stochastic games with imperfect information 554–558
SETHURAMAN, J. AND RAO, J. S. Weak convergence of empirical distribution functions of random variables subject to perturbations and scale factors 299–313
SHAMAN, PAUL. An approximate inverse for the covariance matrix of moving average and autoregressive processes 532–538
SHIRAHATA, SHINGO. Locally most powerful rank tests for independence with censored data 241–245
SIEGMUND, D. AND POLLAK, M. Approximations to the expected sample size of certain sequential tests 1267–1282
SIEVERS, GERALD L. Multivariate probabilities of large deviations 897–905
SPRUILL, M. C. AND MOORE, DAVID S. Unified large-sample theory of general chi-squared statistics for tests of fit 599–616

SMITH, FURMAN AND KIMELDORF, GEORGE. Discrete sequential search for one of many objects 906–915
SRIVASTAVA, MUNI S. AND SEN, ASHISH. On tests for detecting change in mean 98–108
STONE, CHARLES J. Adaptive maximum likelihood estimators of a location parameter 267–284
SUBRAHMANIAM, KOCHERLAKOTA. On the asymptotic distributions of some statistics used for testing $\Sigma_1 = \Sigma_2$ 916–925
SUDJANA AND PILLAI, K. J. S. Exact robustness studies of tests of two multivariate hypotheses based on four criteria and their distribution problems under violations 617–636
TAKEUCHI, KEI AND AKAHIRA, MASAFUMI. Characterizations of prediction sufficiency (adequacy) in terms of risk functions 1018–1024
TAMARI, FUMIKAZU AND HAMADA, NOBORU. Duals of BIB block designs derived from an affine geometry 926–938
TAPIA, R. A., THOMPSON, J. R. AND DE MONTRICHER, G. F. Nonparametric maximum likelihood estimation of probability densities by penalty function methods 1329–1348
THOMSEN, IB. Testing hypotheses in unbalanced variance components models for two-way layouts 257–265
THOMPSON, J. R., DE MONTRICHER, G. F. AND TAPIA, R. A. Nonparametric maximum likelihood estimation of probability densities by penalty function methods 1329–1348
THOMPSON, M. E. AND SEKKAPPAN, RM. On a class of uniformly admissible estimators for finite populations 492–499
TIAHRT, KENNETH J. AND SCHWALLER, RICHARD L. A method of constrained randomization for $p_1^{n_1} p_2^{n_2} \cdots p_k^{n_k}$ factorials 1135–1148
TIJMS, HENK and HORDIJK, ARIE. A modified form of the iterative method of undiscounted dynamic programming 203–208
TRETTER, MARIETTA J. AND WALSTER, G. WILLIAM. Central and noncentral distributions of Wilks' statistic in MANOVA as mixtures of incomplete beta functions 467–472
WAHBA, GRACE. Interpolating spline methods for density estimation. I. Equi-spaced knots 30–48
WAHBA, GRACE. Optimal convergence properties of variable knot, kernel, and orthogonal series methods for density estimation 15–29
WALKER, HOMER F., GUSEMAN, L. F., JR. AND PETERS, B. CHARLES, JR. On minimizing the probability of misclassification for linear feature selection 661–668
WALSTER, G. WILLIAM AND TRETTER, MARIETTA J. Central and noncentral distributions of Wilks' statistic in MANOVA as mixtures of incomplete beta functions 467–472
WEDEL, HANS AND ODÉN, ANDERS. Arguments for Fisher's permutation test 518–520

WICHURA, MICHAEL J. AND PERLMAN, MICHAEL D. A note on substitution in conditional distribution 1175–1179
WIJSMAN, R. A. Exponentially bounded stopping time of the sequential t-test 1006–1010
WINTER, B. B. Rate of strong consistency of two nonparametric density estimators 759–766
WITHERS, C. S. Convergence of empirical processes of mixing rv's on [0, 1] 1101–1108
WRIGHT, F. T. AND ROBERTSON, TIM. Consistency in generalized isotonic regression 350–362
ZEHNWIRTH, BENJAMIN. Minimax interval estimators of location parameters 451–456

NOTES

BICKEL, P. J. AND ROSENBLATT, M. Corrections to "On some global measures of the deviations of density function estimates" 1370
CAUSEY, B. Correction to "Upper confidence and fiducial limits to the range of several means" 1188
HASEGAWA, MINORU AND PERLMAN, MICHAEL D. Correction to "On the existence of a minimal sufficient subfield" 1371–1372
PERLMAN, MICHAEL D. AND HASEGAWA, MINORU. Correction to "On the existence of a minimal sufficient subfield" 1371–1372
PIRIE, WALTER R. Correction to "Comparing rank tests for ordered alternatives in randomized blocks" 796
ROSENBLATT, M. AND BICKEL, P. J. Corrections to "On some global measures of the deviations of density function estimates" 1370
WIJSMAN, ROBERT A. Correction to "A monotonicity property of the sequential probability ratio test" 796

OBITUARY

DUPAČ, VÁCLAV. Jaroslav Hájek, 1926–1974 1031–1037